

Conference Report
Reaching for New Heights
Kentucky Height Modernization Forum

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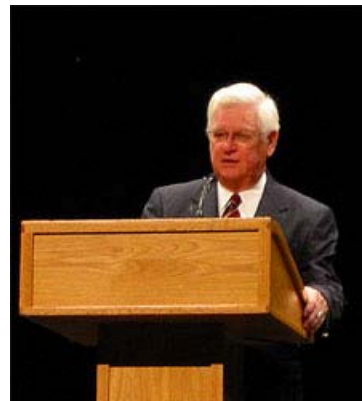
Reaching for New Heights, a Kentucky Height Modernization Forum, was held at the Center for Rural Development in Somerset on October 25, 2004. The forum increased awareness of the problem with Kentucky's decaying benchmarks and aimed to solicit support for a height modernization program. During the full-day event, the broad range of applications was illustrated, and success stories were shared by other states already implementing height modernization programs. The forum was sponsored by the National Oceanic Atmospheric Administration's National Geodetic Survey (NOAA's NGS), Morehead State University, Kentucky

Division of Geographic Information and the Kentucky Transportation Cabinet. Morehead State University President Ronald Eaglin provided opening remarks and introduced Congressman Hal Rogers, who set the tone for the day with his keynote address.

"Identifying how we can use the new emerging technologies to make our lives better is at the heart of why I'm here and why you're here and why the Center is here in fact. I'm not an engineer or surveyor, but I do recognize the importance of having access to reliable and accurate mapping data, particularly as it relates to the safety and security of our people..."

The KY Height Modernization program is critical to that future. It impacts highway planning, design, construction. Saving us time and money, it will be critical to flood plain mapping...

So I am pleased to announce today that KY will receive funding for Height Modernization in NOAA's fiscal 05 budget. We've got language that has been included in the House passed funding bill for NOAA and the Commerce Department, and that guarantee's that Kentucky will have a seat at the table in these efforts. This is the first time that Kentucky has been listed for funding in this program."



Following a morning break, presentations demonstrated the applications of reliable and accurate elevation data from the business perspective and in federal flood map activities. Mike Ritchie, past president of The Management Association for Private Photogrammetric Surveyors (MAPPS), presented *The Business End of Elevation* which demonstrated how elevation has been important to several diverse projects throughout Kentucky. These projects included bridge building on the Ohio River, hydraulic studies of the Mississippi River, photogrammetry for Digital Ortho Quarter Quads (DOQQs), Light Detection and Ranging (LIDAR) collection for flood mapping, and airport paving and obstruction surveys. Laura Algeo, Federal Emergency Management Agency (FEMA), then spoke on *Multi-Hazard Flood Map Modernization*. She explained FEMA's Flood Map Modernization Project and Cooperating Technical Partners (CTP) Program. She then discussed the benefits of height modernization's improved vertical control in multi-hazard flood map products and risk evaluation.

The afternoon session began with an overview of Height Modernization and examples of its application in precision agriculture and surveying. Dave Zilkoski, Deputy Director of NOAA's NGS, provided context by reviewing the development of height modernization programs over the past decade in *The National Height Modernization Program Overview*. He also discussed the benefits experienced by successful programs in Louisiana, Texas, California, North Carolina, and Wisconsin. Tim Stombaugh, University of Kentucky's Department of Biosystems and Agricultural Engineering, discussed *Positioning Systems in Agriculture*. Illustrating a broad range of spatial technology applications in precision agriculture, he emphasized the importance of accurate terrain models. In *The Importance of Accurate Elevations*, Mark Meade, a Professional Engineer and Surveyor with Photo Science, Inc., presented the current status of elevation control networks in Kentucky and the need to improve access to quality elevation data for engineering and surveying activities.

Additional reports addressed the methods and status of height modernization efforts in North Carolina and Wisconsin. Gary Thompson, North Carolina Department of Environment and Natural Resources, presented *National Height Modernization System in North Carolina*, beginning with a review of progress since the state's 1998 pilot project. North Carolina merged height modernization efforts with Floodplain Mapping activities by using a dense vertical network combined with Global Positioning System (GPS) Continuously Operating Reference Stations (CORS) to provide ground control for LIDAR. Digital Elevation Models (DEMs) were then used to determine the predicted extent of flooding. Paul Hartzheim, Wisconsin Department of Transportation, completed the presentations with *Wisconsin Height Modernization Program, Improving the Vertical Component of the Geodetic Network*. Wisconsin efforts focused initially on establishing a dense network of benchmarks throughout the state, determining a primary network with conventional geodetic leveling, and transferring elevation to a secondary network using GPS. The state is now piloting the establishment of a GPS CORS network. Both North Carolina and Wisconsin have enjoyed tremendous cost savings by using established vertical control networks, enhanced by height modernization to support Real Time Kinematic GPS surveying. One Wisconsin county realized a 6:1 time savings ratio in the accuracy checking of a Digital Orthophotography project.

Following the presentations, conference attendees selected a panel discussion session from one of three topic areas: Administrative, Technical or Research & Education. The panel discussion sessions provided an opportunity for further consideration and promoted input from participants. Discussions included suggestions relating to Kentucky's particular needs for Height Modernization and ideas to ensure a successful implementation. Each session was led by a group of panelists assisting with the guided discussion and included the earlier presentation speakers. Participants recorded ideas they considered most important and submitted them on a feedback form. All responses are provided in Appendix C of this report. Themes include a concern for the development of a fully defined implementation plan and the need to establish a CORS network in Kentucky.

One hundred fifty-one participants attended the conference. Nearly half of the attendees are affiliated with local, state or federal government, and half represent the academic or business community. Forty-seven percent are registered land surveyors. About one-third of the attendees submitted feedback forms from the breakout sessions. Of these, half attended the Technical panel discussion, while the remaining attendees split fairly evenly between the Administrative or Research & Education panel discussions. Approximately one-fourth of the forum attendees filled out the on-line conference evaluation form distributed after the event. Seventy-eight percent found that the *panel discussions were valuable* while eighteen percent were neutral or disagreed. Ninety-four percent thought the *forum was a success* while six percent were neutral and none disagreed.

Appendixes:

- A) Agenda
- B) Presentations
- C) Panel Sessions Feedback
- D) Conference Evaluation

Kentucky Height Modernization Forum

October 25, 2004

8:00 – 9:00	Registration	
9:00 – 9:05	Welcome - Michael Hail, Morehead State University	
9:05 – 9:35 Introductory Remarks	Morehead State University President Ronald Eaglin	
9:35 – 10:30 Keynote Address	Congressman Hal Rogers	
10:30 – 10:50	Break	
10:50 – 11:25 Vision	The Business End of Elevation Mike Ritchie Management Association for Private Photogrammetric Surveyors	
11:25 – 11:50 Application	Multi-Hazard Map Modernization Laura Algeo, P.E. Federal Emergency Management Agency	
11:50 – 1:00	Lunch Remarks by Lonnie Lawson, Center for Rural Development Executive Director	
1:00 – 1:35 Overview	Achieving New Heights Dave Zilkoski NOAA's National Geodetic Survey	
1:35 – 2:25 Impact of Height Mod	UK Precision Agriculture Tim Stombaugh University of Kentucky	
	From the Ground Up Mark Meade Photo Science	
2:25 – 2:45	Break	
2:45 – 3:45 State Case Studies	National Height Modernization Systems Applications in NC Gary Thompson North Carolina Department of Environment and Natural Resources	
	Wisconsin Height Modernization Program Paul Hartzheim Wisconsin Department of Transportation	
3:45 – 4:30 Panel Discussions (Select One)	Identifying needs and designing a Height Mod program for the Commonwealth	Administrative Mike Ritchie, MAPPS Bill Jones, KY Transportation Cabinet Juliana Blackwell, National Geodetic Survey
		Technical Mark Meade, Photo Science Gary Thompson, North Carolina; Paul Hartzheim, Wisconsin Ronnie Taylor, National Geodetic Survey
		Research & Education Steven Parkansky, panel moderator Christine McMichael and Zachary Bortolot, Morehead State U. Lindell Ormsbee and Tim Stombaugh, University of Kentucky Dave Zilkoski, National Geodetic Survey

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